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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,673	04/14/2004	Toshiyasu Tanaka	2004-0540A	4880

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WENDEROTH, LIND & PONACK, L.L.P.
2033 K STREET N. W.
SUITE 800
WASHINGTON, DC 20006-1021

EXAMINER

BOUTSIKARIS, LEONIDAS

ART UNIT PAPER NUMBER

2872

DATE MAILED: 11/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/823,673

Applicant(s)

TANAKA ET AL.

Examiner

Leo Boutsikaris

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 22-35 is/are rejected.
- 7) ☒ Claim(s) 15-21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/14/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

Claims 4-10, 15-21 are objected to because of the following informalities:

In claims 4, 15, the phrase “approximate to each other” should be replaced by “approximately equal to each other”, for better clarity.

Claims 5-10, 16-21 inherit the deficiency of claims 4, 15 from which they depend.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-12, 22, 24, 26, 28, 30, 32, 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 22, 24 recite “the diffraction element functions to equalize the first and second diffraction efficiencies to each other”. It is not clear whether the above phrase means that the

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diffraction grating is such that the zero order diffraction efficiency is the same for both wavelengths, the first order diffraction efficiency is also the same for the two wavelengths, etc., or not. Based on the specification, it will be taken that the former is true.

Claims 2-12, 26, 28, 30, 32, 34 inherit the deficiency of claims 1, 24 from which they depend.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yukawa (US 2005/0163018) in view of Murakawa (JP 2001-281432).

Yukawa discloses an optical head system comprising a diffraction grating 17 (Figs. 2-3), wherein light of two different wavelengths, e.g., 785 nm and 655 nm, is transmitted and diffracted through the grating, the grating having land portions and groove portions and a depth of D. Yukawa teaches that the depth of the grating may be adjusted so that the diffraction efficiency at the various orders and at the two wavelengths may be adjusted/optimized ([0042]-[0045]). However, Yukawa does not explicitly teach that the duty ratio is also another design parameter for adjusting the diffraction efficiency at the various orders. Murakawa discloses an optical head system (Fig. 6) incorporating diffraction gratings. In the Abstract portion of the disclosure, Murakawa teaches that, in the diffraction grating shown in Fig. 1, the diffraction

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efficiency of the light transmitted therethrough may be adjusted/optimized by adjusting the duty ratio of the grating. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the duty ratio as a design parameter in order to adjust the diffraction efficiencies of light transmitted/diffracted by the grating disclosed by Yukawa, as taught by Murakawa, since the availability of an additional design/control parameter allows for a more efficient and accurate design of the diffraction efficiency.

Claims 14, 23, 25, 27, 29, 31, 33, 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yukawa (US 2005/0163018) in view of Murakawa (JP 2001-281432) and further in view of Ueyama (US 2005/0141391).

Regarding claim 14, Yukawa in view of Murakawa discloses all the limitations of the above claim except for teaching that the optical head system is used in conjunction with a blue and a red laser instead of a combination of a red and an IR laser. However, Yukawa does suggest that optical head can be used with other light sources of different wavelengths ([0092]). Ueyama in disclosing an optical pickup system he teaches that said system may be used with laser sources including a blue laser of 400 nm ([0185]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Yukawa's optical pickup system with a blue laser and a red laser (operating at approximately 400 and 650 nm, respectively) as taught by Ueyama, since the smaller the wavelength is the easier it is for the optical system to operate close to diffraction limited performance.

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Regarding claim 23, Yukawa's optical pickup system further includes an optical lens 5 for condensing the laser light onto the recording medium 2, and a photodetector 13 for outputting an electric signal in response to light reflected from the recording medium.

Regarding claims 25, 27, Yukawa's optical pickup system further includes a servo system for controlling the optical head (Fig. 6).

Regarding claims 29, 33, the optical pickup system is used in conjunction with an optical information medium player/recorder, e.g., CD/DVD ([0029]).

Regarding claims 31, 35, Yukawa does not explicitly teach the use of the optical pick up system in conjunction with a car navigation system or an optical disc server. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the optical pickup of Yukawa in conjunction with the above applications, since Official Notice is taken that optical disks are widely used with car navigation systems as well as optical servers due to their enhanced capacity and ease of storing and retrieving information.

Allowable Subject Matter

Claims 1, 22, 24 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Claims 2-12, 26, 28, 30, 32, 34 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims, and if claims 4-10 overcome the objections set forth in this Office Action.

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Claims 15-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and if they overcome the objections set forth in this Office Action.

Claims 1-12, 15-22, 24, 26, 28, 30, 32, 34 are allowable over the prior art of record, for at least the reason that even though the prior art discloses diffraction gratings whose duty ratio is adjusted so that the diffraction efficiency of light transmitted therethrough is adjusted accordingly, as well as optical pickup systems comprising a pair of diffraction gratings for adjusting the diffraction efficiencies at two different wavelengths, the prior art fails to teach or reasonably suggest, regarding claims 1-12, 22, 24, 26, 28, 30, 32, 34, a diffraction grating wherein the diffraction grating functions to equalize the first and second diffraction efficiencies to each other by only the one face of the diffraction element, and wherein the phase modulation imposed on the first and second laser beams is given by equations (1) and (2), and regarding claims 15-21, a method of designing a diffraction grating formed on only one face of a light-transmittable member, wherein a zero-order diffraction efficiency of the first laser beam and that of the second laser beam are approximately equal to each other and a first order diffraction efficiency of the first laser beam and that of the second laser beam are approximately equal to each other, as set forth by the claimed combination.

It is noted that the function of a diffraction grating is uniquely determined by its design, i.e., by the choice of the various dimensional parameters in conjunction with the operational wavelength.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Leo Boutsikaris whose telephone number is 571-272-2308.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Leo Boutsikaris, Ph.D., J.D.
Primary Patent Examiner, AU 2872
November 7, 2005



LEONIDAS BOUTSIKARIS
PRIMARY EXAMINER